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April 7, 1994

Memo to: File

Memo from: Scott Milovich

RE: Tank Seam Permit Application, Co-Op Mining Company, Bear Canyon Mine, ACT/015/025-93B, File Folder #2, Emery County, Utah. Re-Submittal 3/01/94

HYDROLOGIC RESOURCE INFORMATION

ANALYSIS

BTCA Areas

BTCA areas H through T are described as "...covered with erosion control matting until the establishment of a good vegetative cover." There is no indication of how or whether the erosion control matting will be maintained.

Culverts

The culvert outlets on the Tank Seam Access Road are described as being placed on bedrock and/or at points where rip rap could be maintained in the channel. There is no information regarding what constitutes a point where rip rap could be maintained.

Reclaimed Drainages

The Typical Cross Sections of channels RC-1A and RC-1B show the channels being cut into bedrock and with bedrock sides. This condition is not described elsewhere in the information provided.

The Typical Cross Section for channel RC-1A shows 18" to 54" rock energy dissipators placed randomly on the bedrock bottom of the channel at slopes greater than 15%. It is doubtful that the rock energy dissipators placed on the bedrock in the steep slopes of the channel will stay in place, and there are no calculations provided to show that they will.

No information has been provided regarding the design detail of the point of transition between the constructed channels RC-1A and RC-1B and the undisturbed portion of the drainage channel.



Channel stability has not been addressed. If the channels are cut into the bedrock as shown in the Typical Cross Sections then stability of the channel side slopes is not a problem, if not, then the stability of the side slopes needs to be considered.

Plate 7-1E shows three culverts crossing the proposed road which drain areas AU-2, AU-2A and AU-2B. The Post Mining Watershed map, Plate 7-7, shows only two reclaimed channels crossing the road. In addition, there is no reclamation channel indicated where culvert C-17U crosses the road.

Channel RC-1B as shown on Plate 7-7 does not appear to connect to channel RC-1A or RC-1.

The regulations regarding reclamation hydrology (R645-301-760) state that natural drainage patterns will be restored and that cut and fill slopes will be reshaped to complement the drainage pattern of the surrounding terrain. There is no information provided that describes the natural drainage patterns in the area or the existing natural channels. An analysis of natural channel conditions and patterns that occur in the area can be used as a basis for design of reclamation channels and as an indicator of potential for reclamation success.

Culvert C-12D shown on Plate 7-1E appears to drain out onto the pad and not into any channel. If this is depicted correctly then an assumption is being made that water will exit the culvert and sheet flow across the pad to be filtered by the silt fence before leaving the disturbed area. This practice would be quite difficult to maintain and deserves to be examined further.

Findings

1. Indicate that erosion control matting will be maintained until a good vegetative cover is established.
2. Describe what criteria will be used to determine at which point rip rap can be maintained in the channel at a culvert outlet.
3. Clarify the cross sections of channels RC-1A and RC-1B to show material of the side slopes or indicate that the channels are cut into bedrock. Also indicate on Plate 7-7 at which point these cross sections will be typical i.e., where the channel crosses the road or along the entire length of the channel.
4. Provide information/calculations to support the decision to place rock energy dissipators on bedrock in channels with slopes greater than 15%, or revise the section to show a clear channel.
5. Provide a drawing that details the transition between the constructed reclamation channels and the natural drainage channels.

6. If the reclaimed channels are not cut into the bedrock as shown on the typical cross sections, provide information regarding the material to be used for the side slopes of the channels and show that the side slopes will be stable.

7. Plate 7-7 Post Mining Watershed needs to be revised to show what occurs when culvert C-17U is removed, to clarify the route of channel RC-1B, and to show how culverts C-22U, C-23U, and C-24U are being reclaimed using only two channels RC-1A and RC-1B. A map scale of 1"=50' would be more appropriate to show the detail required.

8. Provide information that shows the existing profile and existing cross sections of the channels affected. This information is required to make a determination as to whether or not the plan is adequate to restore natural drainage patterns and compliment the drainage pattern of the surrounding terrain as required by the regulations.

9. Clarify outlet condition and flow from culvert C-12D across the pad shown on Plate 7-1E.